



REVIEW

# Effects of *Nigella sativa* on glycemic control, lipid profiles, and biomarkers of inflammatory and oxidative stress: A systematic review and meta-analysis of randomized controlled clinical trials

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## Funding information

Qazvin University of Medical Sciences, Grant/Award Number: IR.QUMS.REC.1398.306

The aim of this systematic review and meta-analysis was to evaluate the effects of *Nigella sativa* (*N. sativa*) on glycemic control, lipid profiles, and biomarkers of inflammatory and oxidative stress. Two independent authors systematically examined online databases consisting of, EMBASE, Scopus, PubMed, Cochrane Library, and Web of Science from inception until October 30, 2019. Cochrane Collaboration risk of bias tool was applied to assess the methodological quality of the studied trials. The heterogeneity among the included studies were assessed using the Cochrane's Q test and *I*-square (*I*<sup>2</sup>) statistic. Data were pooled using a random-effects model and weighted mean difference (WMD) was considered as the overall effect size. A total of 50 trials were included in this meta-analysis. We found a significant reduction in total cholesterol (WMD: −16.80; 95% CI: −21.04, −12.55), triglycerides (WMD: −15.73; 95% CI: −20.77, −10.69), LDL-cholesterol (WMD: −18.45; 95% CI: −22.44, −14.94) and VLDL-cholesterol (WMD: −3.72; 95% CI: −7.27, −0.18) following supplementation with *N. sativa*. In addition, there was significant reductive effect observed with *N. sativa* on fasting glucose (WMD: −15.18; 95% CI: −19.82, −10.55) and HbA1C levels (WMD: −0.45; 95% CI: −0.66, −0.23). Effects of *N. sativa* on CRP (WMD: −3.61; 95% CI: −9.23, 2.01), TNF- $\alpha$  (WMD: −1.18; 95% CI: −3.23, 0.86), TAC (WMD: 0.31; 95% CI: 0.00, 0.63), and MDA levels (WMD: −0.95; 95% CI: −2.18, 0.27) were insignificant. This meta-analysis demonstrated the beneficial effects of *N. sativa* on fasting glucose, HbA1c, triglycerides, total-, VLDL-, LDL-cholesterol levels.

## KEYWORDS

HDL-cholesterol, insulin resistance, LDL-cholesterol, meta-analysis, *Nigella sativa*, oxidative stress